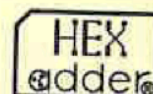


## BASIC INSTRUCTIONS

**INTRODUCTION:** The Hexadder<sup>®</sup> offers a simple mechanization of hexadecimal addition and subtraction. This is accomplished with a series of sliding notched elements manipulated with a metal stylus. Hexadecimal values are entered in the machine initially by addition to zero. Subsequent hex numbers may be added to or subtracted from the value appearing in the answer windows as many times as desired, providing the result is a positive value not exceeding "FFFFFF".



**CLEARING:** All answer windows must be cleared to zero before beginning a new calculation. With the stylus tip inserted in the small hole at the bottom of the clearing slot, slide the internal clear bar to its upper limit and back down again, where it remains during calculations. Should any (↓) arrow still appear in an answer window, it can be reset to zero by inserting the stylus opposite the "1" directly above and moving down to the stop. *Note: This additional step is seldom required as a prior calculation would not end with an arrow showing, but a jarring of the device in carrying could make this necessary before your first use.*

**ADDITION & SUBTRACTION:** As indicated on the face, values to be added are entered in the upper half of the device, and those to be subtracted, in the lower half. The six columns accommodate values up to six hex digits, entered right-justified. (e.g. the value "D06" to be added or subtracted requires an entry of the "D" in the column third from right; the "0" requires no entry; and the "6" is entered in the right-most column.) Internal sliding elements beneath each column contain notches which form holes at the left of designated hex digits 0-F. Color above and below each notch identifies the hole as either silver or red.

Also indicated on the face are directional reminders for both the normal and "red" conditions. Movement is simply stated as: **toward the answer window unless the hole is red**, in which case movement is away from the window and around the bend. In either case the movement is complete to its respective stop. (i.e. "toward the window" is bringing the stylus tip, within the proper notch, as close to the windows as the slot will permit. "Away from the windows and around the bend" is moving as far from the windows as the slot will permit, and without removing the tip, continuing around the slot curve to your left and returning slightly to its stop.) It is this last movement which automatically causes a single-column carry or borrow. (ex:  $A_9 + 7_4 = 11D - 7_4 = A_9$ )

**APPEARANCE OF ARROWS:** When a double-column carry or borrow occurs in a calculation, an overflow arrow will appear in one of the windows. This will require an additional step to complete your answer. An upward arrow (during addition) is eliminated by "adding" a zero in the column above. A downward arrow (during subtraction) is eliminated by "subtracting" a zero in the column below. In either case the hole will be red, thus the movement is away from the window and around the bend. *Note that the arrow always points both to the column for zero entry, and the direction for movement required.* (ex:  $F_9 + 7 = 100 - 7 = F_9$ )

**DECIMAL TO HEXADECIMAL CONVERSION:** These conversions are very easily done on the adder in conjunction with the HEX VALUE CHART, which can be viewed through the transparent pocket. Taking the decimal digits of your converting value one at a time, locate the corresponding hex value for each in the chart. Simple hex addition on the adder will produce your hex answer in the windows. (ex:  $7658_{10} = 1B58 + 258 + 32 + 8 = 1DEA_{16}$ )

### HEX VALUE CHART

9		895,440	DB,BA0	15,F90	2,328	384	5A	9	9
8		7A1,200	C3,500	13,880	1,F40	320	50	8	8
7		6AC,FC0	AA,E60	11,170	1,B58	2BC	46	7	7
6		5B8,D80	92,7C0	E,A60	1,770	258	3C	6	6
5		4C4,B40	7A,120	C,350	1,388	1F4	32	5	5
4		3D0,900	61,A80	9,C40	FA0	190	28	4	4
3		2DC,6C0	49,3E0	7,530	BB8	12C	1E	3	3
2		1E8,480	30,D40	4,E20	7D0	C8	14	2	2
1		F4,240	18,6A0	2,710	3E8	64	A	1	1
0	989,680	0	0	0	0	0	0	0	0

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## SUPPLEMENTAL OPERATING NOTES

**STYLUS:** The operating stylus should be held at right angles to the device when reaching a stop for better registration in the answer windows. Removal of the stylus from its storage clip is by sliding out the top to preserve the spring clip tension.

**CLEARING HINTS:** The movement of the stylus upward during clearing should avoid excessive speed to prevent driving the sliding elements beyond a zero registration in the answer windows. The following shortcut is suggested for an initial clearing if downward arrows should appear from rough handling. While holding the adder in an upright position about two inches above your desk top, loosen your grip allowing the device to strike the rigid surface in an upright position. This gentle jarring will cause windows to register zeros or greater, and enable a complete clearing operation to zero with the normal procedure.

**IGNORING ARROWS:** While using the adder to add and/or subtract a *series* of values, overflow arrows can *generally* be ignored until the final entry has been made. Any *direct* adding or subtracting in the column showing an arrow will automatically remove it and still produce correct result. (ex:  $F7 + 9 + 3B = 13B$ ) Two instances, however, can cause a recoverable machine jam while continuing calculation with arrows appearing: either an attempted carry into a column showing an upward arrow, or an attempted borrow from one showing a downward arrow. A premature stop will be encountered as the stylus tip rounds the bend and fails to encounter a notch on the backside of the element showing the arrow. For recovery remove the stylus at the point of stopping, clear the arrow in the usual manner, and resume the interrupted movement of the stylus from the point at which it stopped. (ex:  $F7 + 9 + B + 5 = 110$ ) The risk of this additional procedure becoming necessary is generally offset by the time saved in ignoring arrows during long calculations.

**ERROR PROTECTION:** The design of the device offers some protection against stylus movement in the wrong direction. Such an attempt will cause one of two results. The first is the causing of overflow arrows, which when removed by usual procedures will correct the mistaken movement. (exs:  $A + \underline{5} = 0F$ ;  $A + \underline{6} = 10$ ) The second possibility is the meeting of an internal stop prior to the stylus reaching its normal limit. In this case do not remove the stylus from its hole, but simply reverse direction to the normal stop. (exs:  $A + \underline{7} = 11$ ;  $A + \underline{4} = 0E$ )

**HEXADECIMAL TO DECIMAL CONVERSION:** Converting hex to decimal with the adder requires both the use of the Hex Value Chart and a pencil. For this reason hex values can generally better be converted to decimal by use of the ordinary conversion table on the back of the adder and pencil arithmetic.

Exceptions are hex values which are either exactly equal to, or slightly exceed those found in the Value Chart. Decimal equivalents are developed by the subtract and remainder method, using the subtract feature of the device. Enter the hex value for conversion; locate the nearest lower hex value from the chart and record its equivalent decimal digit as the high-order position of your answer, then subtract the hex chart value from your total. Repeat the procedure until all decimal digits are developed, taking care to include zeros when any decimal positions are skipped. If more than two iterations are required, pencil arithmetic with the ordinary decimal table is usually faster. (ex:  $FA8_{16} = 4008_{10}$ )

**DEVICE REPAIR:** Current models of the Hexadder<sup>®</sup> are constructed of quality materials expected to last the life of your use. Should any damage occur or parts become lost, your correspondence is invited. We are a small company and can generally repair or replace parts as needed for a minimum expense.

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